

# Changes in Plant Community Composition of Prairies within **FY14** Lostwood National Wildlife Refuge :FINAL REPORT

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## PROJECT DESCRIPTION

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Lostwood National Wildlife Refuge is the largest contiguous block (28,000+ acres) of northern mixed-grass prairie in the Prairie Pothole Region under Federal ownership. When refuge lands were first purchased in 1935, about 75 percent of uplands on the designated Refuge area remained unbroken (native), mixed-grass prairie. Invasive cool-season grasses such as smooth brome and Kentucky bluegrass pose a widespread imminent threat to biodiversity of these prairies. Management activities or tools such as prescribed fire, grazing and haying are used to maintain native grasses and monitoring flora response to such activities is crucial for long-term success in reaching FWS mission, goals, and objectives.

The first extensive vegetation inventory and monitoring project occurred a decade ago in 2004 on Lostwood NWR and 14 Waterfowl Production Areas (WPA's) in the District. Monitoring intervals of 5-10 years were identified in CCPs, this project represents the first comprehensive monitoring cycle.

## OBJECTIVES AND ALTERNATIVES

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**Objective 1:** Use prior inventory sites/transect locations completed in 2004 to document the contemporary composition of native prairies on Lostwood NWR and WMD.

**Objective 2:** Use pair-wise comparisons to assess changes in prairie composition between the two sampling periods.

**Objective 3:** Determine if management is related to changes in prairie composition. Specifically, determine if the composition of prairie tracts and/or changes in compositions between sampling periods is related to an index of the relative frequency of management (i.e. fire, grazing, haying).

## METHODS AND PROTOCOLS

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The belt transect method described by Grant et al. (2004) which is also used for annual monitoring in the Native Prairie Adaptive Management project (NPAM). In short, belt transects were used to record frequencies of plant species or species groups within each prairie tract. Transects are 25 m long, one transect per 1-2 ha of prairie, at a density sufficient to describe composition for each tract. Transects are the same as those sampled during initial inventory.

## DATA ANALYSIS / MODELS

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Transect data was summarized by percent frequency of occurrence according to specific plant genera or species categories, certain functional groups, or life form groups. Multiple queries have been built into the Access database to address some of the common composition questions such as changes in cool-season invasive or native grass frequency between years, degree of non-native invasion, low shrub component, etc. Data can be exported for manipulation in the program R and will be statistically analyzed at the BYOD workshop in March 2015.

## DATA MANAGEMENT

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An Access database was developed by Inventory & Monitoring database manager Jennifer Zorn to store and manage vegetation data associated with this project.

## SOURCES OF SUPPORT

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The majority of the funding for this project was provided by the Inventory & Monitoring program, with some equipment and other in-kind costs covered by station funds.

## CURRENT STATUS

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Transect data was collected from 31 management units in the Lostwood Complex. All historic and new data were entered or uploaded into the Access database, currently contains data from 3974 transects.

Most, but not all, management units are showing a decrease in native frequency and an increase in smooth brome and/or Kentucky bluegrass compared to 10 years ago, with a couple units showing ~50% reduction in native plant frequency according to queries run within the database.

The next step will be to determine if changes in composition are related to an index of the relative frequency of management. Management activities that have occurred within the Lostwood Complex will be updated in the database, and we plan to incorporate vegetation data for Des Lacs NWR which was collected in 2004 and again in 2012-2013.

## CHALLENGES

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The biggest challenge faced during this project was locating GIS data that included specific transect names. Over the last decade, personnel changes and new computers/servers within the Complex made locating spatial data very difficult.

## MORE INFORMATION

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Please contact Laurie Richardson, Wildlife Biologist, Lostwood Complex, 701-848-2722 ext 17 (Laurie\_Richardson@fws.gov).

## LITERATURE CITATION

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Grant, T.A., E.M. Madden, R.K. Murphy, K.A. Smith, and M.P. Nenneman. 2004. Monitoring native

prairie vegetation: the belt transect method.  
Ecological Restoration 22:106-112

